

In the Drawings

The Examiner has required that FIG. 1 be designated by a legend "Prior Art." A replacement sheet for FIG. 1 is enclosed herewith, with FIG. 1 duly indicated as being prior art.

REMARKS

Applicant respectfully requests reconsideration. Claims 1-37 were previously pending in this application. By this amendment, Applicant is canceling claims 9 and 10 without prejudice or disclaimer. Claim 27 has been amended. No new claims have been added. As a result, claims 1-8 and 11-37 are pending for examination with claims 1, 11, 17, and 31 being independent claims. No new matter has been added.

Elections/Restrictions

The Office Action repeats a telephonic Restriction Requirement between Group I and Group II claims. Telephonically, Applicant had provisionally elected the Group I claims, which election is confirmed. However, the election was with traversal, not without traversal. The Office Action is in error.

The restriction was made on the basis of a combination/subcombination relationship and as stated in the Office Action, such a relationship establishes distinctness only where (1) the combination as claimed does not require the particulars of the subcombination as claimed for patentability and (2) the subcombination must have utility by itself or in other combinations. While Application agrees that practice of the invention of claim 1, for example, does not require practice of the particulars of claim 11, the Office Action fails to establish that claims 11-16 define a subcombination invention which has utility by itself or in other combinations. A mere conclusory statement that it has separate utility "such as correcting of the desired output voltage" is insufficient to support a restriction requirement. See MPEP 803. Further, the Office Action incorrectly asserts that the inventions require a different field of search. Note that the claims of both groups are classified in the same sub-class: Class 716, sub-class 2. Manifestly, a single search will cover both groups of claims. Consequently, there is insufficient support for the election requirement and it should be withdrawn.

Claim Rejections – 35 U.S.C. §112

Claims 1-10 and 17-29 have been rejected under 35 U.S.C. §112, second paragraph as assertably being incomplete for omitting essential elements. Reconsideration is requested.

In rejecting claim 1, the Examiner indicates that an omitted element is “it is not clear ‘output value’ (claim 1) of what in the circuit is scaled.” The claim is definite and complete and will be understood by one skilled in the art. The Examiner is confusing breadth with indefiniteness and has not identified any essential element that is omitted. It is not essential to specify in claim 1 a specific output value that is scaled. To do so would narrow the scope of the claim without any justification. The claim specifies “scaling an output value of said circuit” and there is nothing indefinite, unclear or omitted in specifying “an output value.” If the Examiner believes that there is an essential element omitted, it is incumbent on her to specify what that omitted element is. She has not done so. Nor can she. The rejection, therefore, should be withdrawn.

Similarly, in rejecting claim 17, the Examiner has simply said that the omitted element is “of what” “said output” is an output, or so the confusing language of the rejection appears. The rejection further states “for examination purposes, Examiner considers output voltage.” The rejection is not only terribly ungrammatical and unclear, but unfounded and the assumption is unwarranted. In the first place, the language of the claim is “said output value” not “said output.” “Said output value” refers to “means for scaling an output of said circuit to a desired output value.” There is nothing missing and nothing uncertain. The claim is completely clear and definite. The claim does not require that the output value be voltage as opposed to current and the Examiner is unjustified in assuming this limitation. Accordingly, the rejection of claim 17 should be withdrawn.

Claims 9 and 10 have been cancelled, so their rejection is moot.

Turning to claim 27, the stated basis for the rejection is the omission of essential elements, but then in paragraph 11, the Examiner appears to be complaining about the clarity of the claim. The rejection states “claim 27 is formulated unclear to what Applicant intent to mean.” Applicant agrees that claim 27 was unclear. The claim has now been amended and should be perfectly clear. Applicant has adopted the Examiner’s suggestion of reciting that the

DAC is coupled to a source of current rather than to a current itself, although Applicant believes there is no difference.

With respect to dependent claims, no further comments are required.

Claims Rejections – 35 U.S.C. §101

Claim 36 has been rejected “because the claimed invention directs to non-statutory claim invention wherein carrier signal is not a proper machine, manufacture or composition of matter.” However, claim 36 does not claim a carrier signal, even if a carrier signal were non-statutory subject matter, which it is not. The Federal Circuit has ruled that a signal may be claimed as a physical element and an article of manufacture. However, that is entirely irrelevant because the claim is not directed to claiming a carrier signal. Rather, the claim is to a computer program product which comprises a medium having embodied therein program instructions for performing a specified method, and further having a carrier signal on the medium. There is absolutely nothing that is non-statutory about the claim. Even if a “carrier signal” is a non-statutory element (whatever that means), it is settled law that adding non-statutory subject matter to an otherwise statutory claim does not make the claim as a whole non-statutory. Moreover, even if this were a signal claim, which it is not, courts have consistently found signal claims to be patentable, and expressed principles consistent with these findings. The patentability of signals is not a new concept. The Supreme Court found a claim covering a signal patentable subject matter in 1854 when it upheld such a claim¹ in one of Samuel Morse’s telegraph patents. See *O’Reilly v. Morse*, 56 U.S. 62 (1854):

I claim as my invention the system of signs consisting of dots and spaces and of dots, spaces and horizontal lines for numerals, letters, words or sentences substantially as herein set forth and illustrated for telegraph purposes.

Signals are articles of manufacture. More recently, the courts have interpreted the term “manufacture” as used in 35 U.S.C. § 101 to mean “the production of articles for use from raw or prepared materials by giving to these materials new forms, qualities, properties or combinations, whether by hand labor or by machinery.” *Diamond v. Chakrabarty*, 447 U.S. 303, at 308, 206 (1980) (quoting *American Fruit Growers, Inc. v. Brogdex Co.*, 283 U.S. 1, 11 (1931)). The

USPTO has at times asserted that the courts' definition of manufacture requires physical substance, which signals do not have. However, this interpretation is inconsistent with the courts. The Federal Circuit has consistently held that reading limitations into Section 101 regarding subject matter that may be patented where the legislative history does not indicate that Congress clearly intended such limitations is improper. *See In re Alappat*, 33 F.3d 1526, 1542 (Fed. Cir. 1994) (en banc); *see also, State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 149 F.3d 1368, 1373 (Fed. Cir. 1998); *Arrhythmia Research Technology, Inc. v. Corazonix Corp.*, 958 F.2d 1053, 1064 (Fed. Cir. 1992) (Rader, J., concurring). Furthermore, computer software that is embodied in a signal, whether a carrier wave, baseband, or otherwise, does not fall within any of the three recognized exceptions of patentable subject matter. The signal is not a law of nature, natural phenomenon, or abstract idea. Instead, the signal is an article of manufacture that arises from the practical application of electromagnetic energy. A signal is also the result of a physical transformation analogous to that found patentable in *Diamond v. Diehr*, 450 U.S. 175 (1981). Electromagnetic energy is transformed from a natural state or some intermediate state to form a data signal. Such a signal is physically different and has undergone a physical transformation from its original state. The key factor is that a physical transformation has occurred - not the extent of the transformation. The resulting signal is the product of a physical transformation which would not exist absent the transformation.

The courts have further construed 35 U.S.C. § 101 as defining patentable subject matter to be that which has a practical application that produces a useful, concrete, and tangible result. *See State Street Bank*, 149 F.3d at 1373-74. A signal is a practical application that produces a tangible result. The result of the application of such signals is readily measurable and because it enables the function of the systems in which it is implemented – enables useful results in the operation of the computer systems. A signal, whether transmitted via a wire or wireless technology, can be a unique signal specifically designed to convey specific information or data. A signal is part of the technology that enables computer-encoded functions to operate. Thus, a signal may transmit process steps so that a useful, concrete and tangible result is achieved (e.g. in a computer).

Additionally, the Office at times (e.g., in its draft Interim Guidelines) has erroneously asserted that a signal is not a manufacture because it does not fall into the definition of a “manufacture” defined as being a residual class of product in 1 *Chisum on Patents*, § 3 1.02[3] (citing W. Robinson, *The Law of Patents for Useful inventions* 270 (1890)). The Office concludes that, “[a] product is a tangible physical article or object, some form of matter, which a signal is not”. However, the tangible nature of a product is not a requirement for patentability under 35 U.S.C. § 101. The Supreme Court did not state that the definition of manufacture under Section 101 requires a tangible article in either *American Fruit Growers* or *Chakrabarty*. Also, as noted above, the Federal Circuit has warned against engrafting additional requirements on to the definition of patentable subject matter under Section 101. But, even if the Office maintains such a tangibility requirement for patentability under Section 101, a signal is a tangible product under any interpretation of such term.

According to *Webster’s Third New International Dictionary of the English Language Unabridged* 2337 (Philip Babcock ed., 1993), tangible means “able to be perceived as materially existent.” Signals, albeit *transitory* in duration, exist in reality and have properties that are physically measurable because they are typically comprised of electron flows that vary over time. See Harry Newton, *Newton’s Telecommunications Dictionary* 244 (17th ed. 2001), see also, *A Dictionary of Physics* (John Daintith ed., 2000). Thus, signals may be sensed or perceived using appropriate electronic equipment and its properties can be analyzed and manipulated as desired.

Signals also fall within the definition of computer usable media or computer readable media. A computer is able to detect the signal and recover the computer program embodied therein. It makes no difference whether the computer program is embodied in a physical media such as a hard drive or computer memory or within a data signal.

As stated above, a signal is a tangible product that falls within the statutory categories of patentable subject matter. The underlying program is usable by the computer and is thus patentable as reflected in the Interim Guidelines, Annex IV(c), page 57:

[F]rom a technological standpoint, a signal encoded with functional descriptive material is similar to a computer-readable

memory encoded with functional descriptive material, in that they both create a functional interrelationship with a computer. In other words, a computer is able to execute the encoded functions, regardless of whether the format is a disk or a signal.

Therefore, signal claims fall within at least one of the statutory classes of invention under 35 U.S.C. § 101 whether claimed specifically as a signal or whether claimed as a computer program product. Signal claims are necessary to properly protect and inventor's interest in their invention. Absent such claims, the public would be free to exploit the patentee's invention.

Manifestly, the rejection should be withdrawn.

Claim Objections

Claims 20-22 and 28 were objected to. Reconsideration is requested.

The Examiner objected to claim 20 as having insufficient antecedent basis for the term "the value of the constant current". However, claim 20 depends from claim 19 and claim 19 states "forcing a constant current". Therefore, the antecedent is supplied in claim 19. The objection should be withdrawn.

An objection has been made to claims 21, 22 and 28 with the statement "the proper dependency has to be established as per terms 'current' and 'voltage'" but such language is unclear and Applicant cannot understand the nature of the objection. Having reviewed these claims, Applicant does not find any improper dependency or lack of antecedent basis. Applicant requests that the Examiner reconsider and withdraw the objection.

Claim Rejections – 35 U.S.C. §102

Claims 1-10, 17, 23, 24, 26, 27, 29-31 and 35-37 have been rejected under 35 U.S.C. §102(e) as anticipated by Marınca '847. As noted by the Examiner, Marınca '847 is assigned to the same assignee as the present application. However, the '847 patent does not disclose the claimed invention. All of the claims herein relate to compensating for a linear temperature effect using a two-temperature technique. Marınca '847 only relates to a non-linear error component in which compensation is made at a single temperature. Please refer to the two figures below.

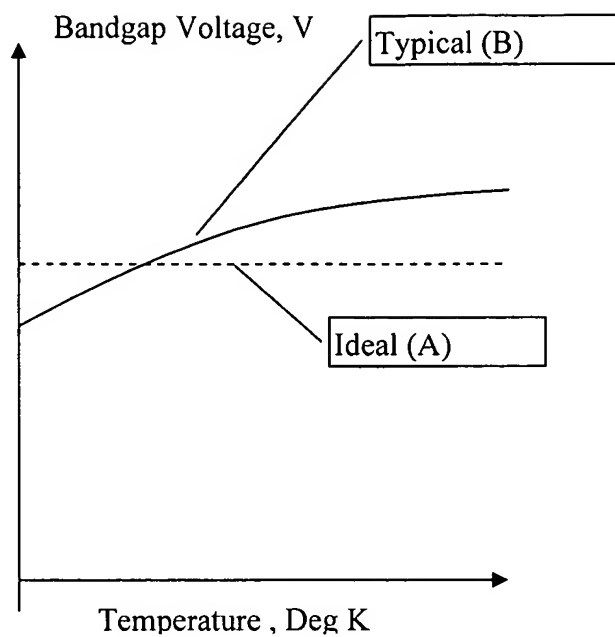


Fig 1 : Bandgap Voltage variation with temperature

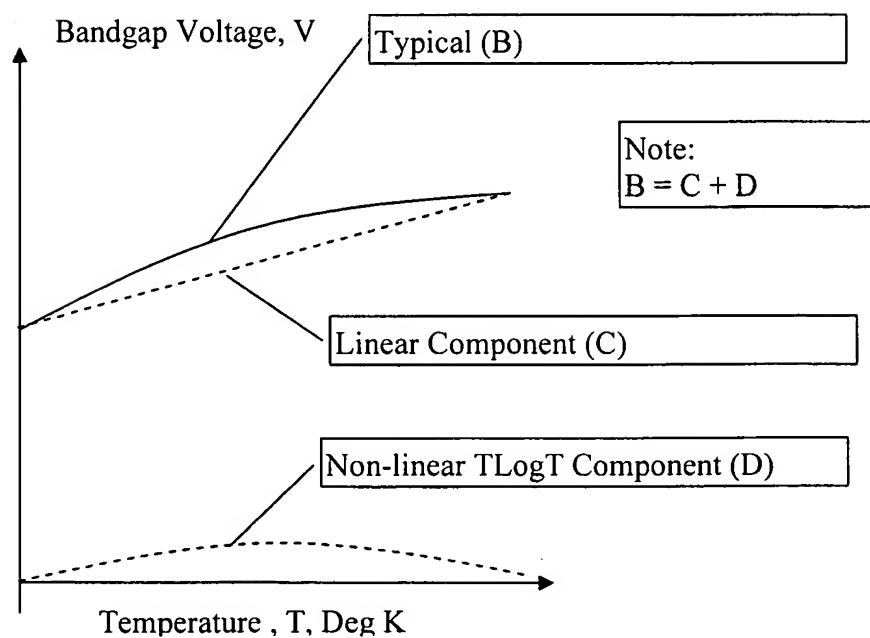


Fig 2 : Components of typical characteristic

As explained in the background section of the application, a bandgap voltage reference ideally should have a value which is constant as temperature varies. This is shown as dashed line A in Fig. 1, above. The actual performance, however, will vary from this ideal, as indicated by curve B. The deviation from the ideal consists of two components: (a) a slope error which exhibits a linear variation over temperature (shown as line C in Fig. 2 above) and (b) a second, non-linear component which has TlogT behavior as a function of temperature (shown as line D in Fig. 2). The Marınca '847 patent is related to the TlogT component only (curve D) and how this component can be removed by appropriate adjustment at a single temperature and makes no mention whatever of adjustments at two temperatures. The claims are therefore not rejectable as anticipated by Marınca '847 and neither can Marınca '847 be used as the basis for an obviousness rejection in light of the common ownership at the time both inventions were made, per Section 103(c). Accordingly, the rejection has been overcome and should be withdrawn.

Allowable Subject Matter

Applicant notes with appreciation the indication that the subject matter of claims 18-22, 25, 28 and 32-34 is allowable if appropriately rewritten in independent form and to overcome the noted informalities and rejections under §112. In light of the foregoing remarks and request for reconsideration, however, Applicant holds in abeyance the possibility of thus rewriting these claims.

Relative to the statement of reasons for the indication of allowable subject matter, Applicant defers comment other than to state that the statement incorrectly gives the appearance that the claims can be dissected down to a point of novelty and that the Examiner has correctly identified such points of novelty. The inventive subject matter is indicated by each claim as a whole and non-obviousness is determined by the totality of the claim combination, not by a single limitation.

CONCLUSION

A Notice of Allowance is respectfully requested. The Examiner is requested to call the undersigned at the telephone number listed below if this communication does not place the case in condition for allowance.

If this response is not considered timely filed and if a request for an extension of time is otherwise absent, Applicant hereby requests any necessary extension of time. If there is a fee occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 23/2825.

Respectfully submitted,



Steven J. Henry
Reg. No. 27,900
Wolf, Greenfield & Sacks, P.C.
600 Atlantic Avenue
Boston, MA 02210-2211
(617) 646-8000

Docket No.: T0461.70041US00
Date: February 22, 2007

x03/06/07